

3rd IMA Conference on Mathematics of Robotics

Programme

24 – 26 September 2025

Pendulum Hotel Manchester

Sackville Street, Manchester, M1 3BB, UK



INSTITUTE OF
**MATHEMATICS &
ITS APPLICATIONS**

Wednesday 24 September

09:00 – 09:45	Registration with Tea & Coffee
09:45 – 10:00	Welcome
	Session Chair: William Holderbaum
10:00 – 11:00	Keynote 1 - <i>From Maps to Mechanisms</i> Martin Pfurner
11:00 – 11:30	Tea & Coffee break
11:30 – 12:00	<i>Kinematic synthesis over curves using cellular decompositions and Chebyshev interpolants</i> Jonathan Hauenstein
12:00 – 12:30	<i>On flexes associated with higher-order flexible bar-joint frameworks</i> Georg Nawratil
12:30 – 13:30	Lunch
	Session Chair: Jon Selig
13:30 – 14:30	Keynote 2 - <i>Model-based and learning approaches to cloth manipulation by robots</i> Carme Torras
14:30 – 15:00	<i>Rigid-Body Motions Following the Sannia Frame of a Ruled Surface</i> Derya Bayril
15:00 – 15:30	<i>Inverse kinematic model for generic 3R positional robots using Conformal Geometric Algebra</i> Abhilash Nayak
15:30 – 16:00	Tea & Coffee break
	Session Chair: Jonathan Hauenstein
16:00 – 16:30	<i>Geometric analysis of generic 3R robots, and necessary and sufficient conditions for a class of orthogonal robots to have four I</i> Abhilash Nayak
16:30 – 17:00	<i>A Constrained Saddle Search Approach for Constructing Singular and Flexible Bar Frameworks</i> Xuenan Li

Thursday 25 September

	Session Chair: William Harwin
09:00 – 10:00	Keynote 3 - Origami Design for Continuously Foldable Uniaxial Bases Ileana Streinu
10:00 – 10:30	<i>Bifurcations and Equivariant Morse</i> Stuart Taylor
10:30 – 11:00	<i>Singly-periodic pointed pseudotriangulations have an expansive motion</i> Jack Esson
11:00 – 11:30	Tea & Coffee break
	Session Chair: Andreas Müller
11:30 – 12:00	<i>Further development of a mathematical model for the motion of a micro-robot consisting of three spheres linked with retractable</i> Edmund Chadwick
12:00 – 12:30	<i>Analysis of a Cuspidal 6R Robot</i> Alexander Feess
12:30 – 13:30	Lunch
13:30	Lab visit Manchester University
15:00	Lab visit The NERIC (North of England Robotics Innovation Centre) building, University of Salford
19:00	Optional pub dinner at The Wharf (Please notify IMA staff on the day if interested in attending)

Friday 26 September

	Session Chair: Guowu Wei
09:00 – 10:00	Keynote 4 – Robots for Nuclear Decommissioning Barry Lennox
10:00 – 10:30	<i>A cubic product of exponentials (POE) spline cannot exactly reconstruct a cubic curve on SE(3)</i> Andreas Mueller
10:30 – 11:00	<i>A library of open chain linkage dynamics</i> William Harwin
11:00 – 11:30	Tea & Coffee break
	Session Chair: William Holderbaum
11:30 – 12:00	<i>Sixth-order singularities of the 3RR planar pentad mechanism</i> Charles Wampler
12:00 – 12:30	<i>Distortion Bounds of Subdivision Models for SO (3)</i> Chee Yap (Presented by Jonathan Hauenstein)
12:30	Conference Close Packed lunches provided